

Transformation of  $\alpha$ - and  $\beta$ -alkylfuranidines into the corresponding  $\alpha$ - and  $\beta$ -alkylpyrrolidines. XXVI. Yu. K. Yur'ev and I. P. Grigorov (Lomonosov State Univ., Moscow); *Zhur. Obshch. Khim. (J. Gen. Chem.)* 20, 171-4 (1950); cf. C.A. 44, 14824, 44605. — Alkylfuranidines (tetrahydrofurans) were converted to the corresponding alkylpyrrolidines (I) by dropping them (0.7 drops/min.) in strong  $\text{NH}_3$  stream into an  $\text{Al}_2\text{O}_3$ -filled tube at 350°; fresh catalyst was used for each run. The following I are described: 3-Me (30% from 3-methylfuranidines),  $b_m$  102.3°,  $d_4^{20}$  0.8590,  $n_D^{20}$  1.4081 (parate, m. 101.5-7.5°); 3-Et (10%),  $b_m$  131°,  $d_4^{20}$  0.8579,  $n_D^{20}$  1.4501 (parate, m. 101-1.5°); 3-Pr (15%),  $b_m$  158°,  $d_4^{20}$

0.8535,  $n_D^{20}$  1.4521 (parate, m. 101.5-101°); 3-Bu (12%),  $b_m$  170-0.2°,  $d_4^{20}$  0.8463,  $n_D^{20}$  1.4531 (parate, m. 76-0.5°); 2-Pr (10%),  $b_m$  149-51°,  $d_4^{20}$  0.8250,  $n_D^{20}$  1.4489; 2-Bu (10%),  $b_m$  173.5-4.5°,  $d_4^{20}$  0.8277,  $n_D^{20}$  1.4400.

G. M. Kosolapoff

Simultaneous catalytic dehydration of 1-butyne-1,4-diol with ammonia and with hydrogen sulfide. Catalytic dehydration of *cis*-2-butene-1,4-diol. Yu. K. Yurev, I. K. Korobitsyna, and E. K. Brige (M. V. Lomonosov State Univ., Moscow). *Zhur. Obshchei Khim.* (J. Gen. Chem.) 20, 744-8 (1950); cf. C. A. 43, 8004c. — Passage of (1)  $C_4H_8O_2$  (I) at 6-8 drops/min. in N over  $Al_2O_3$  at 400° gave much C, some  $C_2H_4$ ,  $H_2O$ , and traces of furan (detected qualitatively). At 350° I gave  $C_2H_4$ , detected as  $(CH_3)_2$  by absorption in  $Br-CHCl_3$ . I (10 g.) treated as above over aluminosilicate catalyst at 0 drops/min. with concurrent passage of  $NH_3$ , gave 6.3-0.75 g. pyrrole, the max. yield being obtained at 400°; the use of a  $H_2S$  atm. at 350° over  $Al_2O_3$  similarly gave a trace of thiophene, and at 400° 0.5 g. was obtained. Hydrogenation of I over Raney Ni in EtOH gave 40.3%; *cis*-2-butene-1,4-diol,  $b_p$  115-16°,  $n_D^{20}$  1.4734,  $d_4^{20}$  1.0003; this (10 g.) heated with 2 g. aluminosilicate catalyst to 100-70° gave 4 g. noxaq. distillate, yielding on distn. 33% dihydrofuran,  $b_p$  65.5-6.0°,  $d_4^{20}$  0.9224,  $n_D^{20}$  1.4249, which with Br in  $CCl_4$  with strong cooling gave 3,4-dibromotetrahydrofuran,  $b_p$  90.5-1.5°,  $n_D^{20}$  1.5600,  $d_4^{20}$  2.0414, while the remainder of the catalyze yielded 23%  $MeCH_2-CH(CH_3)-CH_2-CH_2-$  (100% 2°,  $n_D^{20}$  1.4362,  $d_4^{20}$  0.8511 (semicarbazone, m. 188-7°). G. M. Kozlovskii

Comparative reactivity of ammonia and aniline in reaction with furan and furanidine. XXVIII. Yu. K. Yur'ev, I. K. Korobitsyna, and M. I. Kuznetsova (M.V. Lomonosov State Univ., Moscow). *Zhur. Obshchei Khim.* (J. Gen. Chem.) 20, 1001 (1950); cf. *Usknye Zapiski Akad. Nauk SSSR, Univ. in M. V. Lomonosov* No. 79, 84, 89, 145, 61 (1955). C.A. 44, 59609. On the basis of the competitive reactivity of  $\text{NH}_3$  and  $\text{PhNH}_2$  in simultaneous addn. to furan or furanidine the following is noted: Furan with mists of  $\text{NH}_3$  and  $\text{PhNH}_2$  yields only 1-phenylpyrrole, and only traces of pyrrole; furanidine gives only 1-phenylpyrrolidine, and traces of pyrrolidine. The results are due to more ready opening of polar  $\text{C}-\text{O}$  links in the ring by the weaker base ( $\text{PhNH}_2$ ). The reactions were performed in a tube over  $\text{AlCl}_3$  at  $400-500^\circ$  with the vapors of the desired N-derivs. for gas flow. Yields of 18-23% of phenylated products were obtained. 1-Phenylpyrrole, b.  $94-5^\circ$ , m.  $61-2^\circ$ ; 1-phenylpyrrolidine, b.  $100-11^\circ$ ,  $n_D^{20}$  1.502,  $d_4^{20}$  1.0152. Passage of  $\text{PhNH}_2/\text{NH}_3$  over  $\text{AlCl}_3$  in a N stream at  $400^\circ$  readily gives a mixt. of  $\text{NH}_3$  (90% of theory) and  $\text{PhNH}_2$  (61% isolated), which can be used for the competition expts. Reactions with  $\text{PhNH}_2/\text{NH}_3$  and furanidine gave a small yield of carbazole, m.  $241-6^\circ$ , as a by-product.

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A comparison of the activities of ammonia and aniline in  
the reaction with furan and furandiol. XXVIII. Yu. K.  
Vut'ev, I. K. Kozubitsyna, and M. I. Kuznetsova. *J. Gen.  
Chem. U.S.S.R.* 20, 1535-6 (1950) (Engl. translation). See  
C.A. 45, 6680b. R. M. S.

Preparation of 2,4-dimethylfuran by pyrolysis of a sulfone.  
 Yu. K. Yur'ev, G. Va. Kondrat'eva, and S. N. Petrov  
 (M. V. Lomonosov State Univ., Moscow). *Doklady Akad.  
 Nauk S.S.S.R.* 72, 523-5 (1950).—Mesityl oxide with  $\text{Cl}_2$   
 gave 45% of the sulfone, m. 60°, 5 g. of which, dry-distd.  
 with 20 g.  $\text{CaO}$ , 20 g.  $\text{CuO}$ , 10 g. Fe filings, and 25 g. Phr-  
 and  $\text{H}_2\text{O}$ , gave 76% 2,4-dimethylfuran, bp 94°,  $n_D^{20}$  1.4371,  
 $d_4^{20}$  0.8983; with maleic anhydride it yields the adduct,  
 $\Delta^4$ -3,5-dimethyl-7,8-endoxotetrahydrophthalic anhydride, m.  
 75° (from  $\text{Et}_2\text{O}$ ), decomp. 160°. If the distn. above is done  
 only with  $\text{CaO}$ - $\text{Na}_2\text{CO}_3$ , with solid  $\text{NaOH}$ , or with 40%  
 $\text{NaOH}$ , only  $\text{Me}_2\text{CO}$  (40-55%) is obtained and no furan  
 deriv. is detected.  
 G. M. Kosolapoff

1,2-Dithiolane (trimethylene disulfide) from trimethylene sulfide. Yu. K. Yur'ev and I. S. Levi (M. V. Lomonosov State Univ., Moscow). *Doklady Akad. Nauk S.S.S.R.* 73, 953-6(1950).—Passage of  $\text{CH}_2(\text{CH}_2)_2\text{S}$  (50 g.) over

$\text{Al}_2\text{O}_3$  at  $250^\circ$  at 10 g./hr. in a N atm. gave much  $\text{H}_2\text{S}$  and 6 g. catalyzate, which on diln. with  $\text{Et}_2\text{O}$  gave 0.3 g. solid, m.  $72-4^\circ$ , and much C; the off-gas contained much H and olefins. A similar expt. with 25 g. sulfide run in a  $\text{H}_2\text{S}$  atm. gave 8.0 g. catalyzate that solidified on standing and, on redistn., m.  $70.5-7.5^\circ$  (from pyridine); some 0.6 g. pure product thus obtained was 1,2-dithiolane, confirmed by analysis, mol. wt., and conversion to 1,3-propanedithiol, b.p.  $170-1^\circ$ ,  $n_D^{20}$  1.5392,  $d_4^{20}$  1.0772, upon heating 16 hrs. with Zn and 50%  $\text{H}_2\text{SO}_4$ ; the dibenzate, m.  $55.5-0.5^\circ$  (from  $\text{EtOH}$ ), was identical with an authentic specimen. Repetition of the synthesis at  $350^\circ$  with 50 g. sulfide gave 2 g. dithiolane, b.p.  $83-100^\circ$ , m.  $70.5-7.5^\circ$ . The product fails to give reactions characteristic of mercaptans or sulfides.

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Reaction of ethylene oxide and ethylene glycol with ammonia at elevated temperature in the presence of aluminum oxide. Yu. K. Yurev, K. Yu. Novitski, and E. I. Mingulina (M. V. Lomonosov State Univ., Moscow). *Doklady Akad. Nauk S.S.S.R.* 74, 87 (1970). While ethylene oxide (I) and  $\text{NH}_3$  in the presence of  $\text{Al}_2\text{O}_3$  at 400-500° are reported to yield pyridine and its homologs (Mahnovskii and Moryganov, *C.A.* 42, 1563b) and  $\text{AcH}$  and  $\text{NH}_3$  over  $\text{Al}_2\text{O}_3$  at 425° yield alkylated pyridines, an investigation of the reaction of I with  $\text{NH}_3$  over  $\text{Al}_2\text{O}_3$  at 400° gave indications that only pyridine homologs form, and no pyridine can be detected among the products; the reaction probably proceeds by isomerization of I into  $\text{AcH}$ . Passage of I at 10 g./hr. in  $\text{NH}_3$  at 400° over  $\text{Al}_2\text{O}_3$  gave 35 g. catalyze from 300 g. I; fractionation gave 2.6 g.  $\text{AcH.NH}_3$ , m. 97°, and mixed 2- and 4-methylpyridines (identified after extensive fractionation and further crystalization of the picrates and methiodides). Although a fraction b. 113-17° was obtained, it was not pyridine, but a crude mixt. of the methylpyridines (Mahnovskii, *et al.*, *ibid.*). Passage of  $\text{CH}_2\text{OH}_2$  (8 drops/min.) in  $\text{NH}_3$  over  $\text{Al}_2\text{O}_3$  at 400° gave, from 275 g. glycol, 276 g. catalyze that yielded 1 g.  $\text{AcH.NH}_3$  and mixed 2- and 4-methylpyridines, identified as above; no pyridine was detected. (G. M. Kosolapov)

1951

YUR'YEV, YU. K.; KONDRAT'YEVA, G. YA.; DERBENEVA, A. A.

Furanidines

Simultaneous catalytic dehydration of 2, 5-dialkyl and 2, 2, 5, 5-tetraalkylfuranidines with hydrogen sulfide. Uch. zap. Mosk. un., No. 132, 1950.

Monthly List of Russian Accessions, Library of Congress, October 1952 UNCLASSIFIED.



YUR'YEV, Yu. F., VERDELASHTEYN, ZINOV'IEVA, L. A.

Pyrrolidones

Transformation of butyrolactone into  $\alpha$ -pyrrolidone and N-phenyl-  $\alpha$ -pyrrolidone, Uch. zap. Mosk. un., No. 132, 1950.

9. Monthly List of Russian Accessions, Library of Congress, October 195<sup>4</sup>/<sub>2</sub> 1953. Unclassified.

CA

Nitration, bromination, and carbonylation of 1-phenylpyrrolidine. Yu. K. Yur'ev, I. S. Korzakova, and A. V. Arbatskii (Moscow State Univ.). *Izv. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1951, 166-71. —Slow addn. of 13 ml.  $\text{HNO}_3$  (d. 1.35) to 10 g. 1-phenylpyrrolidine (I) in 70 ml.  $\text{AcOH}$  at  $-20^\circ$  leads to an active reaction when the addn. is complete; after standing overnight the soln. yields 52% 1-(*p*-nitrophenyl)pyrrolidine, yellow, m.  $100^\circ$  (from  $\text{EtOH}$ ). A higher temp. and slower addn. (20 min. instead of 10 min.) give poorer yields. (Luvalle, *et al.* (C.A. 43, 534c), give a m.p. of  $167-8^\circ$  for the product.) Reduction by powd. Sn-coacd.  $\text{HCl}$  gave the *p*- $\text{NH}_2$  analog, isolated as the  $\text{HCl}$  salt, m.  $208^\circ$ , which with  $\text{NaOH}$  and  $\text{BaCl}_2$  gave the 1-(*p*-benzamidophenyl) analog, m.  $236^\circ$  (from  $\text{EtOH}$ ). Addn. of an equimolar amt. of Br to 10 g. I in  $\text{AcOH}$  at  $15^\circ$  gave the *p*-Br deriv., isolated as the  $\text{HBr}$  salt, m.  $178^\circ$  (from abs.  $\text{EtOH}$ ), which with alkali gave the free base, m.  $103^\circ$  (from  $\text{Et}_2\text{O}$ ). The best yield (90%) is obtained with 10.5 g. Br and 40 ml.  $\text{AcOH}$  as solvent when addn. takes 10 min. at  $15^\circ$ ; higher or lower temps. give lower yields, the former yielding some di-Br deriv. which is difficult to sep. Treatment of 1 g. *p*-Br deriv. suspended in  $\text{H}_2\text{O}$  with a soln. of  $\text{HNO}_3$  from 6.3 g.  $\text{NaNO}_2$ , 10 ml.  $\text{H}_2\text{O}$ , and an equimolar amt. of  $\text{HCl}$  immediately gave the yellow ppt. of the *p*- $\text{NO}_2$  analog, m.  $100^\circ$ , identical with above described specimen. Addn. of 9 g. *p*-Br deriv. in 100 ml.  $\text{Et}_2\text{O}$  to a soln. of  $\text{BuLi}$  (contg. 5.8 g.  $\text{BuLi}$  (by titration) in 25 ml.  $\text{Et}_2\text{O}$ ) in a N at., and refluxing 5 hrs. gave upon pouring the mixt. on dry ice, extr. with 5%  $\text{KOH}$ , and acidification with  $\text{AcOH}$ , 0.2 g. *p*-(1-pyrrolidyl)benzoic acid, m.  $270^\circ$  (decomps.; from  $\text{EtOH}$ ), also formed in 17% yield on treating 0.7 g.

Li in  $\text{Et}_2\text{O}$  in a N atm. with 3.5 g. *p*-Br deriv. in  $\text{Et}_2\text{O}$  re fluxing 2 hrs., and filtering onto dry ice. G. M. E.

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Academician Nikolai Dmitrievich Zelinski. R. Ya.  
Levina and Yu. K. Yur'ev. *Vestnik Moskov. Univ.* 6,  
No. 2, Ser. Fiz.-Mat. i Estestv. Nauk No. 1, 7-35 (1951). --  
Biography with several portraits and complete bibliogra-  
phy (248 references) on Zelinski's work. G. M. K.

YUR'YEV, Yu.K.; KORSAKOVA, I.S.; ARBATSKIY, A.V.

Nitration, bromination and carboxylation of N-phenylpyrrolidine.  
Izv.Akad.nauk SSSR; Khim.otd. no.2:166-171 Mar-Apr 51. (CLML 20:7)

1. Laboratory of Organic Chemistry imeni N.D. Zelinskiy of Moscow  
State University.

YUR'YEV, Yu.K.; NOVITSKIY, K.Yu.; LITEROV, L.G.

Obtaining of monoethanolarylamines from the ethylene and arylamines  
oxide. Izv.Akad.nauk.SSSR;Khim.otd. no.3:317-327 May-June 1951.  
(CML 20:9)

1. Laboratory of Organic Chemistry imeni N.D. Zelinskiy of Moscow  
State University.

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Academician Nikolai Dmitrievich Zelinski. Yu. K. Vur'ev and R. Ya. Levina. *Zhur. Obshch. Khim.* (J. Gen. Chem.) 21, 201-32 (1951).—Biography, with portrait, and summary of scientific work (243 references) on 90th jubilee.  
G. M. Kozlovskii

eA

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Behavior of furan and furanidines with metallic sulfides and amides. XXIX. Yu. K. Yur'ev and V. A. Tronova (Moscow State Univ.). *Zhur. Obshchei Khim.* (J. Gen. Chem.) 21, 256-8 (1951); cf. *Uchenye Zapiski Moscov. Gosudarst. Univ.* 79, 166 (1945); *C.A.* 45, 5680b.—Furan and furanidine heated with sulfides or amides of metals do not exchange their O for S or NH. Thus, pyrites,  $\text{FeS}_2$ ,  $\text{FeS}$ ,  $\text{Al}_2\text{S}_3$ , at 325-600° fail to yield any S-heterocycles from either O-heterocycles, which are recovered (28-92% recoveries, depending on conditions used); the decomposition products were not studied. However, passage of furanidine in the presence of 2 parts steam at 300-400° over  $\text{Al}_2\text{S}_3$  gave up to 32.5% thiophene, bps 119-20°,  $n_D^{20}$  1.5050,  $d_4^{20}$

0.9990. Furan (at 400°) or furanidine (at 400°) passed over  $\text{Al}_2\text{S}_3$  amide gave a trace of pyrrole (qual. test) or pyrrolidine, resp. Reaction of methyl pyromucate with aniline. XXX. Yu. K. Yur'ev and E. G. Venediktov. *Ibid.* 260-64.—Passage of 8 g. *Me 3-furoate*, bp 60-61°,  $n_D^{20}$  1.4873,  $d_4^{20}$  1.1781, and 24 g.  $\text{PhNH}_2$  over  $\text{Al}_2\text{O}_3$  in a N stream at 475° gave 14 g.  $\text{PhNH}_2$  and 1.5 g. (17%) 1-phenylpyrrole (I), m 58°. At 400° the yield is 35%, while at 350° 22% is obtained, along with about 8% furan if a 1:2 molar ratio of  $\text{PhNH}_2$  is used. Heating 1 g. ester with 2.7 g.  $\text{PhNH}_2$  and 0.3 g. activated  $\text{Al}_2\text{O}_3$  in a sealed tube 8 hrs. to 350° gave 0.2 g. I, but at 310°, 87.5%; 2-furanamide, m 123°, was obtained; at 270° as at 220°, the yield was 68.5%. Refluxing 10 g. ester, 27 g.  $\text{PhNH}_2$ , and 1 g.  $\text{Al}_2\text{O}_3$  15 hrs. at 100° gave  $\text{PhNH}_2$ , a trace of I, and 51% 2-furanamide if  $\text{Al}_2\text{O}_3$  is omitted no reaction occurs. Passage of 10 g. ester over  $\text{Al}_2\text{O}_3$  in a N atm. at 350° gave  $\text{CO}_2$ , 0.9 g. furan, and 4 g. unchanged ester; the ester is unchanged on passage over glass in a N atm. at 350° (a trace of  $\text{CO}_2$  forms). Furan and  $\text{PhNH}_2$  passed over  $\text{Al}_2\text{O}_3$  in a N atm. at 400° gave 21% I; hence the  $\text{MeO}_2\text{C}$  group in position 2 facilitates replacement of the nuclear O. Reaction of methyl tetrahydropyromucate with aniline. XXXI. *Ibid.* 261-7.—Passage of *Me 3-furoate* in a H atm. over  $\text{PtO}_2$  at 160° gave 78% *Me tetrahydrofuroate*, bp 170.5-80.5°,  $n_D^{20}$  1.4371,  $d_4^{20}$  1.1060. This (10 g.) and 27 g.  $\text{PhNH}_2$  passed in a N atm. over  $\text{Al}_2\text{O}_3$  at 300° gave  $\text{CO}_2$ , 14 g.  $\text{PhNH}_2$ , and 1.5 g. 1-phenylpyrrolidine, bp 104.5°,  $n_D^{20}$  1.5840,  $d_4^{20}$  1.0101, pyrrole, m 116°. Passage of the ester at 300° over  $\text{Al}_2\text{O}_3$  in a N atm. gave  $\text{CO}_2$ , propene, and  $\text{MeOH}$ . Hydrolysis of the ester with 2 N  $\text{NaOH}$  4 hrs. at reflux gave 76% free acid, a sirupy microcryst. mass; this heated to 270-300° begins to lose  $\text{CO}_2$ , which occurs freely at 300-5°, yielding furanidine, bps 65°,  $n_D^{20}$  1.4088,  $d_4^{20}$  0.8890. G. M. K.

1937

YUR'EV, YU. K.

"XXX. The reaction of methyl furoate with aniline." by Yu. K. Yur'ev, and E. G. Vendel' shuein. (p.259)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1951, Volume 21, No. 2



YUR'EV, YU. K.

"XXXI. The reaction of methyltetrahydrofuroate with aniline." by Yu. K. Yur'ev  
E. G. Vendel'shtein. (p.264)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1951, Volume 21, No. 2

C.A.

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Preparation of monoethanolarylamines from ethylene oxide and arylamines. Yu. K. Yurlov, K. Yu. Novitskii, and L. G. Liberman (Moscow State Univ.), *Izv. Akad. Nauk S.S.S.R., Khim. Nauk* 1951, 317-20. — Passage of ethylene oxide (I) (44 g.) into 100 g.  $\text{PhNH}_2$  and 35 ml.  $\text{H}_2\text{O}$  at  $14-16^\circ$  in 3-4 hrs. (at the end of the reaction the temp. rises spontaneously to  $70-80^\circ$  in spite of the cooling bath) and distn. yields 78.5%  $\text{PhNHCH}_2\text{CH}_2\text{OH}$ , b.  $170^\circ$ ,  $n_D^{20}$  1.5760,  $d_4^{20}$  1.0945,  $\rho_{\text{water}}$  m.  $124^\circ$  (from EtOH). When equimolar ams. are used, the yield drops to 32%. Stirring does not appear to affect the yield. Similarly, p-toluidine at  $60-70^\circ$  in the presence of 20% (by wt.) of  $\text{H}_2\text{O}$  gives 80%  $p\text{-MeC}_6\text{H}_4\text{NHCH}_2\text{CH}_2\text{OH}$ , b.  $135^\circ$ , m.  $42^\circ$  ( $\rho_{\text{water}}$  m.  $89^\circ$ ); o-toluidine (90% yield), b.  $149^\circ$ ,  $n_D^{20}$  1.5700,  $d_4^{20}$  1.0794 ( $\rho_{\text{water}}$  m.  $130^\circ$ ). 1-CuH<sub>6</sub>NH<sub>2</sub> (71.5 g.), 10 ml. EtOH, and 10 ml.  $\text{H}_2\text{O}$  treated with 11 g. I after initial heating on a steam bath gave 76.5% 1-CuH<sub>6</sub>NHCH<sub>2</sub>CH<sub>2</sub>OH, b.  $182^\circ$ , m.  $50^\circ$  ( $\rho_{\text{water}}$  m.  $100^\circ$ ). o-Anisidine under the above conditions gave 80% o-MeOC<sub>6</sub>H<sub>4</sub>NHCH<sub>2</sub>CH<sub>2</sub>OH, b.  $183^\circ$ ,  $n_D^{20}$  1.5737,  $d_4^{20}$  1.1504 ( $\rho_{\text{water}}$  m.  $139^\circ$ ); p-toluidine (70% yield), b.  $187^\circ$ , m.  $41^\circ$ . G. M. K.

Chem A

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Chromium oxide on alumina oxide as a catalyst in transformation of heterocycles. XXXII. Yu. K. Yur'ev and V. A. Trunova (Moscow State Univ.), *Zhur' (Zhukovskii Khim. (J. Gen. Chem.))* 21, 742 (1951); cf. *Bull. Moscow State Univ.* 79, 135, 146 (1945); C.A. 41, 1653i; 45, 7563h. — The optimum temp. of transformation of furandine (I) into pyrrolidine (II) or thiophane (III) lies below that of similar reactions over  $Al_2O_3$  alone, but the yields of II and III are severely reduced. In the presence of  $Cr_2O_3$ , the formation of II from I at 350–500° is accompanied by dehydrogenation, forming pyrrole, best at 400°; carbazole (IV) also forms best at 500°. The latter probably forms from pyrrole and either butadiene or furan arising from I, which dehydrogenates over  $Cr_2O_3/Al_2O_3$  at 500°. Passage of I over the catalyst (9.5–31.5%  $Cr_2O_3$ ) in a  $NH_3$  stream at 300–500° at 0.7 drops/min. readily gave II, pyrrole, and carbazole; the formation of II appears even at 300° with all catalysts, but as the temp. is raised to 500° the amt. of II declines rapidly to 0, while the yield of carbazole rises with increased temp., and that of pyrrole is best at about 400°. The best catalyst compn. is in the higher range of  $Cr_2O_3$  concn. (20–33%). The max. yield of II is but 17% at 300–50° (with  $Al_2O_3$  alone it reaches 30.5% at 350° and 40.5% at 400°). Pure II b.p. 85.5–86.0°,  $n_D^{20}$  1.4431,  $d_4^{20}$  0.8583; *picrate*, m. 111–12° (from EtOH). Pure pyrrole b.p. 130–1°,  $n_D^{20}$  1.5060,  $d_4^{20}$  0.9502. Pure carbazole m. 230°. Passage of I over the catalyst in a  $H_2S$  stream gave best results in the formation of III (78%) at 300°, which were still below the results with  $Al_2O_3$  alone. Pure III, b.p. 110.5–20.0°,  $n_D^{20}$  1.5050,  $d_4^{20}$  0.9059. Passage of 30 g. I over the catalyst (22.5%  $Cr_2O_3$ ) at 8 drops/min. at 500° gave 11.5 g. condensate and 14.1 l. gas (0.4%  $O_2$ , 0.25%  $CO$ , 11%  $CO_2$ , 23% olefins, 6% dienes, 50%  $H_2$ ); the liquid condensate gave furan, b. 28–72°,  $n_D^{20}$  1.4185. G. M. Kozolajoff

1951

C.A.

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Activity of amines in transformations of oxygen-bearing  
into nitrogen-bearing heterocycles. XXXIII. Yu. K.  
Vur'yy and I. K. Korobitsyna (Moscow State Univ.). *Zhur.*  
*Obshch. Khim.* (J. Gen. Chem.) 21, 973-80 (1951); cf.  
C.A. 45, 5080b, 5524c. — Comparative reactivity studies of  
PhNH<sub>2</sub> and aliphatic amines with furanblime (I) showed  
that in reactions of I with mixed EtNH<sub>2</sub> and PhNH<sub>2</sub>, PrNH<sub>2</sub>,  
and PhNH<sub>2</sub>, BuNH<sub>2</sub>, and PhNH<sub>2</sub>, and cyclohexylamine and  
PhNH<sub>2</sub>, there is formed 1-phenylpyrrolidine (II), while in  
reactions with secondary amines (PhNH<sub>2</sub>Et, PhNH<sub>2</sub>Pr,  
PhNH<sub>2</sub>Bu, and cyclohexylamine), are formed II, alk-  
enes, and traces of birlinyl (III). Passing 10 g. I, 12 g. PhNH<sub>2</sub>,  
and 6 g. EtNH<sub>2</sub> at 6-8 drops/min. over Al<sub>2</sub>O<sub>3</sub> in Na at 400° gave  
0.5 g. I-ethylpyrrolidine, bp 102-10° (plate, m. 185-6°),  
and 7 g. II, bp 105-6°, n<sub>D</sub><sup>20</sup> 1.5250, d<sub>4</sub><sup>20</sup> 1.018, as well as 18 g.  
PhNH<sub>2</sub> (the amts. are from 2 combined runs). I (9 g.)  
and 18 g. PhNH<sub>2</sub>Et similarly gave 55% PhNH<sub>2</sub> and 11% II,  
as well as C<sub>6</sub>H<sub>6</sub> (isolated as the dibromide, 60%) and III  
(isolated as the tetrabromide). I (5 g.), 4 g. PhNH<sub>2</sub>, and  
6.5 g. PhNH<sub>2</sub> similarly gave 54.5% PhNH<sub>2</sub> and 10% II.  
Similarly 9 g. I and 17 g. PhNH<sub>2</sub>Pr gave 50% PhNH<sub>2</sub>, 8.5%  
II, C<sub>6</sub>H<sub>6</sub> (isolated as the dibromide, 78%), and a trace of  
III (as above). I, BuNH<sub>2</sub>, and PhNH<sub>2</sub> likewise gave  
54.5% PhNH<sub>2</sub>, and 4% II; I with PhNH<sub>2</sub>Bu similarly  
gave 57% PhNH<sub>2</sub> and 13% II, as well as 60% C<sub>6</sub>H<sub>6</sub>, and a  
little III. I with PhNH<sub>2</sub> and cyclohexylamine (2:1:1 molar  
ratio) gave 60.5% cyclohexene, 60% PhNH<sub>2</sub>, and 4% II;  
at 1:1:1 ratio 67%, 62.5%, and 60%, resp., were formed.  
A 1:1 molar mixt. of I with cyclohexylamine gave 60% cyclo-  
hexene, 50% PhNH<sub>2</sub>, and 6% II. G. M. Kozolapoff

CA

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Catalytic dehydration of trimethylene glycol. Yu. K. Vur'ev and I. S. Levi (Moscow State Univ.). *Dokl. Akad. Nauk S.S.S.R.* 78, 725-8 (1951).  $\text{EtCH}_2\text{CH}_2\text{CH}_2\text{OH}$  (I) (140 g.) passed over  $\text{Al}_2\text{O}_3$  in a weak stream of  $\text{N}_2$  at 10 g./hr. at  $250^\circ$  gave 121 g. catalyzate, of which the fraction b.m.  $45-55^\circ$  (8 g.) of the aq. layer (101 g.) was identified by the Raman spectrum as a mixt. of acrolein and  $\text{EtCHO}$ , and the fraction b.m.  $65.5-5.7^\circ$  (10 g.) as a mixt. of allyl and Pr alcs. Further distn. of the aq. part of the catalyzate yielded unchanged 20 g. I and 3 g.  $\text{OCH}_2\text{CH}_2\text{CH}_2\text{OH}$ . At  $350^\circ$ , 143 g. I gave 95 g. catalyzate (62 g. aq. layer and 23 g. oil). The aq. part gave 2.5 g. unchanged I; the  $45-51^\circ$  fraction (3.5 g.) is a mixt. of about 60% acrolein and 40%  $\text{EtCHO}$ ; the fraction b.  $61-7^\circ$  (3 g.) is a mixt. of 40%  $\text{PrOH}$  and 60% allyl alc. The fraction b.  $139-61.5^\circ$  is  $\text{EtCH}_2\text{CH}_2\text{CH}_2\text{OH}$ . The amts. of gas from 25 g. I were 730 and 2350 cc. (S.T.P.) at  $250$  and  $350^\circ$ , resp., and their compn. (%  $\text{CO}_2$ ,  $\text{CO}$ ,  $\text{H}_2$ ,  $\text{C}_2\text{H}_4$ ,  $\text{C}_2\text{H}_2$ ,  $\text{C}_2\text{H}_6$ ) at  $250^\circ$ : 12.4, 2.2, 8.8, 10.7, 69.9, and at  $350^\circ$ : 7.0, 7.0, 2.8, 3.8, 78.0. Trimethylene nitrile was not detected, and it is considered to be an unstable intermediate product, giving rise to  $\text{EtCHO}$ . Allyl alc. is another intermediate. The formation of acrolein and  $\text{PrOH}$  is attributed to disproportionation of H between allyl alc. and  $\text{EtCHO}$ . To some extent, acrolein can be formed through dehydrogenation of allyl alc. and  $\text{PrOH}$  through its hydrogenation. N. Thon

YUR'YEV, Yu.K.; DYATLOVITSKAYA, S.V.; LEVI, I.S.

Isomerization of  $\alpha$ -methyl trimethylene sulfide into tetramethylene sulfide and other characteristics of four-membered saturated sulfides. Vest.Mosk.un. 7 no.12:55-62 D '52. (MLBA 7:9)

1. Laboratoriya organicheskoy khimii im. akad. N.D.Zelinskogo.  
(Sulfides) (Isomers and isomerization)

YURY V. VU

[illegible]

Organic Chemistry

Catalytic dehydration of 2,2,5,5-tetraalkyl- and 2,5-di-alkylfuranolines in a hydrogen sulfide atmosphere. V. K. Yuzey, G. Ya. Kondrat'eva, P. A. Akshina, and A. A. Drobneva (Moscow State Univ.). *Zhur. Obshch. Khim.* (J. Gen. Chem.) 22, 339-47 (1952).—2,2,5,5-Tetramethyl-tetrahydrofuran, (I), prep'd. by the Grignard route from  $(CH_3)_2CO_2Et$ , followed by dehydration of the glycol, b.p. 112°, n<sub>D</sub><sup>20</sup> 1.4050, d<sub>4</sub><sup>20</sup> 0.8013; 2,2,5,5-tetra-*Et* homolog (II), prep'd. similarly, b.p. 75-8°, n<sub>D</sub><sup>20</sup> 1.4440, d<sub>4</sub><sup>20</sup> 0.8012. 2,5-Di-ethyltetrahydrofuran (III) was prep'd. from 4-octyne-3,5-diol (IV), by hydrogenation and dehydration;  $EtMgBr$  (from 90 g.  $EtBr$ ), treated with  $CaH_2$ , followed by 43.5 g.  $EtClO_4$ , gave 50% IV, b.p. 119°, n<sub>D</sub><sup>20</sup> 1.4703, d<sub>4</sub><sup>20</sup> 0.8789, hydrogenated over Pt black to 70% 2,5-octanediol, b.p. 102.5-4.0°, n<sub>D</sub><sup>20</sup> 1.4522, d<sub>4</sub><sup>20</sup> 0.8331, yielded 56% III [cf. Pogorzelski, *J. Russ. Phys. Chem. Soc.* 50, 984 (1898)], b.p. 142-3°, n<sub>D</sub><sup>20</sup> 1.4215, d<sub>4</sub><sup>20</sup> 0.8419. Passage of I in a  $H_2S$  stream over  $Al_2O_3$  at 250-400° gave the following results: at 250° 26% 2,5-dimethyl-2,5-hexadiene, b.p. 133.5-4.5°, n<sub>D</sub><sup>20</sup> 1.4768, d<sub>4</sub><sup>20</sup> 0.7697; at 320° 30%; and at 400° 25%. II similarly gave at 325° about 30% hydrocarbon, b.p. 197-8°, possibly crude 2,5-dimethyl-2,5-octadiene; at 375°, 27.5%; the purified product b.p. 199.5-200.5°, n<sub>D</sub><sup>20</sup> 1.4600, d<sub>4</sub><sup>20</sup> 0.8008. Similarly, III at 350° gave 12% 2,5-dimethylthiophane, b.p. 183.5-4.5°, n<sub>D</sub><sup>20</sup> 1.4825, d<sub>4</sub><sup>20</sup> 0.9104, along with a small amt. of S-free material, b.p. 76-150°. 2,5-dimethylfuranoline under these conditions gave 43% 2,5-dimethylthiophane, b.p. 140-1°, n<sub>D</sub><sup>20</sup> 1.4818, d<sub>4</sub><sup>20</sup> 0.9226. Passage of I over  $Al_2O_3$  at 320° in a N<sub>2</sub> atm. gave mixed unsat'd. comp'ds. from which was obtained a mixt. of moderately pure 2,5-dimethyl-2,5-hexadiene with other products, detected by Raman spectra, which appear to have been *trans*-2,5-dimethyl-2-hexene and the *cis*-isomer, as well as some alkanes, possibly 2,5-dimethylhexane.

G. M. Kosolapoff



YUR'YEV, YU. K.; VENDEL'SHTEYN, YE. G.; ZINOV'YEVA, L. A.

Lactones

Part 35. Conversion of butyrolactone to thiophanon  
pyrrolidone-2 and 1-phenylpyrrolidone-2. Zhur. ob  
khim. 22, 84, No. 3, 1952. Laboratoriya Organi-  
cheskoy Khimii im. N. D. Zelinskogo Moskovskogo  
Ordena Lenina Gosudarstvennogo Universiteta.

Monthly List of Russian Accessions, Library of  
Congress, August 1952. UNCLASSIFIED.

YUR'YEV, Yu. K.; MONIRAT'DOVA, G. Ya.; KARTASHOVSKIY, A. I.

Heterocyclic compounds

Part 36. Conversion of  $\alpha, \beta$ -dimethylfuran and  $\alpha, \beta$ -dimethylfuranidine to corresponding nitrogen- and sulfur-containing heterocyclic compounds. Zhur. ob. khim. 22 (84) No. 3, 1952. Laboratoriya Organicheskoy Khimii im. N. D. Zelinskogo Moskovskogo Ordena Lenina Gosudarstvennogo Universiteta.

SO: Monthly List of Russian Accessions, Library of Congress, August <sup>2</sup>195~~3~~<sup>8</sup>, Uncl.

ISSK/Chemistry - Organic Sulfur Compounds Apr 52

"XXVII. Conversion of Tetrahydrofuryl Alcohol and Tetrahydrofuryl Mercaptane into  $\Delta^2$ -Dihydrothiopyrene," Yu. K. Yur'yev, Ye. G. Vendel'shteyn, Lab of Org Chem, Moscow State U

"Zhur Oshch Khim" Vol XXII, No 4, pp 687-693

It has been demonstrated previously, that furanidine and its homologues will be converted into thiophane and its homologues under the action of  $H_2S$  in presence of  $Al_2O_3$  at 250 to 400°, and that  $\Delta^2$ -dihydropyrane and tetrahydroprane undergo the same conversion, forming  $\Delta^2$ -dihydrothiopyrane and tetrahydrothiopyrane.

224748

The behavior of tetrahydrofuryl alc and the behavior of tetrahydrofuryl mercaptane in contact with  $Al_2O_3$  in this reaction was investigated.

YUR'YEV, YU. K.

224748

USSR/Chemistry - Effect of Sulfur Compounds Apr 52  
on Dehydrogenation

"Catalytic Dehydrogenation of 1,4-Endoxycyclohexane and 1,4-dioxycyclohexane in a Hydrogen Sulfide Atmosphere," L. K. Yur'yev, G. Ya. Kondrat'yeva, Ye. P. Smirnova, Lab of Org Chem imeni N. D. Zelinskii, Moscow State U

"Zhur'evskii Khim" Vol XXII, No 4, pp 524-526

When 1,4-endoxycyclohexane is introduced into an  $H_2S$  atm over  $Al_2O_3$  at 275° dehydrogenation of the oxide takes place and cyclohexadiene-1,3 is formed. Catalytic dehydrogenation of 1,4-dioxycyclohexane in an  $H_2S$  atm over  $Al_2O_3$  also proceeds only

224719

to cyclohexadiene-1,3. The sulfur comp corresponding to 1,4-endoxycyclohexane, 1,4-endothiocyclohexane is not formed by either of the 2 above substances under the conditions of the reaction.

224719

YUR'YEV, YU. K.

YUR'YEV, Yu. K.

Abstr.

No. 5

10, 1954

Organic Chemistry

(4) 9  
The catalytic dehydration of 1,4-cyclohexanediol and  
1,4-dihydroxycyclohexane in a hydrogen sulfide atmosphere  
Yu. K. Yur'yev, G. Ya. Kondrat'yev, and E. P. Gulyanova  
(Moscow State Univ.), J. Gen. Chem. U.S.S.R. 28:  
757-8 (1952) (Engl. translation). See C 4 47 27114

H. L. H

YU. K. YUR'YEV, I.K. KOROBITSYNA

May 52

USSR/Chemistry Cyclic Amines

"XXXVIII. The Mechanism of Joint Catalytic Dehydration of Furanidine and Secondary Amines,"  
Org. Chem. Lab in Zelinskiy, Moscow State U.

Zhur Obshch Khim, Vol22, No5, pp 852-859

In the reaction between furanidine and secondary amines in the presence of  $Al_2O_3$  at  $400^\circ$ , hydrolysis of the secondary amine takes place first. The primary amine thus formed then enters into reaction with the furanidine.

263 T 34

YUR'EV, Yu. K.

Chem Abs

V.48 25 Jan 54

Organic Chem

$\alpha$ -Oxides and synthesis of compounds of the thiophene series. Yu. K. Yur'ev and E. Yu. Novitskii (Moscow State Univ.). *Zhur. Obshchei Khim.* 22, 2157-9 (1952).  
 Ethylene oxide (I) (200 g.) passed over  $Al_2O_3$  at 230° in  $H_2S$  atm. gave 150 g. catalyzate which yielded 5.6 g. AcH, 3.4 g. dioxane, 2.5 g. 1,4-thioxane, and 2.9 g. 1,4-dithiane, b<sub>p</sub> 95-115°. Similarly 170 g. I at 300° gave 113 g. catalyzate which yielded 5.3 g. AcH and 2.4 g., 1.4%, thiophene (after distn. from Na) in addn. to 2.4 g. thioxane and 1.8 g. dithiane; 210 g. I at 350° gave 4.1 g. thiophene (2%); at 400° the yield of thiophene was 5.1%; and at 450° it was 5.3%. Propylene oxide (II) passed over  $Al_2O_3$  at 400° in  $H_2S$  atm., gave (from 213 g. II) a range of products which yielded 15.6 g. crude 2,4-dimethylthiophene (III), b<sub>p</sub> 136.5-9.0°, which, purified through *chloromercuro* deriv. (m. 138°), b<sub>p</sub> 135.3°, n<sub>D</sub><sup>20</sup> 1.5150, d<sub>4</sub><sup>20</sup> 0.9699. At 225° the same amount of II gave a very low yield of III (1.6 g.). The formation of the dimethylthiophene can be explained by isomerization of II into EtCHO followed by reaction with  $H_2S$ .  
 G. M. Kosolapoff

③ 10

P. L. M. M.

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YUR'YEV, Yu.K.

Reaction of ethylene oxide with ammonia in the presence of aluminum oxide as well as zinc oxide on aluminum oxide. Zhur. Priklad. Khim. 25, 1336-7 '52. (HIRA 5:12)  
(CA 47 no.21:11191 '53)

1. Moscow State Univ.



YUR'YEV, YU. K., KOROBITSYNA, I. K., SAVINA, L. A.

Furanidines

Synthesis and transformation of  $\beta$ -furanidone. Dokl. AN SSSR 86 no. 1, 1952.

Monthly List of Russian Accessions, Library of Congress, December 1952. Unclassified.

YUR'YEV, YU. K.

235T28

USSR/Chemistry - Organosilicon Compounds 11 Sep 52

"Tetracycloxyasilanes in the Synthesis of Ketones of the Thiophene and Furan Series," Yu. K. Yur'yev, G. B. Iel'nikov, Lab of Org Chem Imenl M. V. Lomonosov, Moscow State U Imenl M. V. Lomonosov

"Dok Ak Nauk SSSR" Vol 86, No 2, pp 337-340

Tetracycloxyasilanes (mixed anhydrides of orthosilicic and org acids), obtained from SiCl<sub>4</sub> and org acids, were used in the synthesis of ketones of the thiophene and furan series. The reaction

235T28

was carried out in benzene in the presence of SiCl<sub>4</sub>. The following were prepd: methyl-2-thienyl ketone, ethyl-2-thienyl ketone, n-propyl-2-thienyl ketone, n-butyl-2-thienyl ketone, n-amyl-2-thienyl ketone, n-heptadecyl-2-thienyl ketone, phenyl-2-thienyl ketone, and methyl-2-furyl ketone. Presented by Acad A. N. Nesmeyanov.

(CA 47 no. 17:8725 '53)

235T28

YURYEV, IU. K.

Zhizn' i delatel'nost' akad, N. D. Zelinskogo [Life and work of Academician N. D. Zelin  
skii]. Moskva, Izd-vo Moskovskogo obshchestva ispytatelei prirody, 1953. 118 p

SO: Monthly List of Russian Accessions, Vol 6 No 8 November 1953

ELDERFIELD, Robert Cooley. 1904- ; YUR'YEV, Yu.K., professor [redaktor]  
LUTSENKO, I.F.; BEUTOV, O.A.; KOCHETKOV, N.K. [redaktors].

[Heterocyclic compounds] Geterotsiklicheskie soedinenia. Perevod s ang-  
liiskogo I.F.Lutsenko, O.A.Beutova, N.K.Kochetkova, pod red. I.U.K.IUr'eva.  
Moskva, Izd-vo inostrannoi lit-ry. 1953-  
(MLRA 6:8)  
(Heterocyclic compounds)

YUR'YEV, Yu.K.; LEVINA, R.Ya.

[Life and work of Academician N.D. Zelinskii] Zhizn' i deiatel'nost'  
Akademika Nikolaia Dmitrievicha Zelinskogo. Moskva, Izd-nie Moskovskogo  
go obshchestva ispytatelei prirody, 1953. 115 p. (MIRA 7:7)  
(Zelinskii, Nikolai Dmitrievich, 1861- ) (Chemistry, Organic)



YUR'YEV, Yu.K.; ABRATSKIY, A.V.

Sulfamides, containing a pyrrolidine ring. Vest.Mosk.un. 8 no.2:83-87 F  
'53. (MLRA 6:5)

1. Laboratoriya organicheskoy khimii im. akad. N.D. Zelinskogo.  
(Sulfamides) (Pyrrolidine)

# USSR .

✓ Mechanism of the reaction of tetrahydrofuran with secondary amines. N. N. Yermakov and L. S. Kozlovskaya. Chem. Abstr. 1964, 59, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000



Transformations of 1,3-dimethylpyrrolidone into  
methylphosphane and 1,3-dimethylpyrrolidone

1,3-dimethylpyrrolidone,  $b_p$  152-5°,  $n_D^{20}$  1.4121,  $d_4^{20}$  0.8455,  $n_D^{25}$  1.4080,  $d_4^{25}$  0.8415,  $n_D^{30}$  1.4040,  $d_4^{30}$  0.8380,  $n_D^{35}$  1.4000,  $d_4^{35}$  0.8345,  $n_D^{40}$  1.3960,  $d_4^{40}$  0.8310,  $n_D^{45}$  1.3920,  $d_4^{45}$  0.8275,  $n_D^{50}$  1.3880,  $d_4^{50}$  0.8240,  $n_D^{55}$  1.3840,  $d_4^{55}$  0.8205,  $n_D^{60}$  1.3800,  $d_4^{60}$  0.8170,  $n_D^{65}$  1.3760,  $d_4^{65}$  0.8135,  $n_D^{70}$  1.3720,  $d_4^{70}$  0.8100,  $n_D^{75}$  1.3680,  $d_4^{75}$  0.8065,  $n_D^{80}$  1.3640,  $d_4^{80}$  0.8030,  $n_D^{85}$  1.3600,  $d_4^{85}$  0.7995,  $n_D^{90}$  1.3560,  $d_4^{90}$  0.7960,  $n_D^{95}$  1.3520,  $d_4^{95}$  0.7925,  $n_D^{100}$  1.3480,  $d_4^{100}$  0.7890,  $n_D^{105}$  1.3440,  $d_4^{105}$  0.7855,  $n_D^{110}$  1.3400,  $d_4^{110}$  0.7820,  $n_D^{115}$  1.3360,  $d_4^{115}$  0.7785,  $n_D^{120}$  1.3320,  $d_4^{120}$  0.7750,  $n_D^{125}$  1.3280,  $d_4^{125}$  0.7715,  $n_D^{130}$  1.3240,  $d_4^{130}$  0.7680,  $n_D^{135}$  1.3200,  $d_4^{135}$  0.7645,  $n_D^{140}$  1.3160,  $d_4^{140}$  0.7610,  $n_D^{145}$  1.3120,  $d_4^{145}$  0.7575,  $n_D^{150}$  1.3080,  $d_4^{150}$  0.7540,  $n_D^{155}$  1.3040,  $d_4^{155}$  0.7505,  $n_D^{160}$  1.3000,  $d_4^{160}$  0.7470,  $n_D^{165}$  1.2960,  $d_4^{165}$  0.7435,  $n_D^{170}$  1.2920,  $d_4^{170}$  0.7400,  $n_D^{175}$  1.2880,  $d_4^{175}$  0.7365,  $n_D^{180}$  1.2840,  $d_4^{180}$  0.7330,  $n_D^{185}$  1.2800,  $d_4^{185}$  0.7295,  $n_D^{190}$  1.2760,  $d_4^{190}$  0.7260,  $n_D^{195}$  1.2720,  $d_4^{195}$  0.7225,  $n_D^{200}$  1.2680,  $d_4^{200}$  0.7190,  $n_D^{205}$  1.2640,  $d_4^{205}$  0.7155,  $n_D^{210}$  1.2600,  $d_4^{210}$  0.7120,  $n_D^{215}$  1.2560,  $d_4^{215}$  0.7085,  $n_D^{220}$  1.2520,  $d_4^{220}$  0.7050,  $n_D^{225}$  1.2480,  $d_4^{225}$  0.7015,  $n_D^{230}$  1.2440,  $d_4^{230}$  0.6980,  $n_D^{235}$  1.2400,  $d_4^{235}$  0.6945,  $n_D^{240}$  1.2360,  $d_4^{240}$  0.6910,  $n_D^{245}$  1.2320,  $d_4^{245}$  0.6875,  $n_D^{250}$  1.2280,  $d_4^{250}$  0.6840,  $n_D^{255}$  1.2240,  $d_4^{255}$  0.6805,  $n_D^{260}$  1.2200,  $d_4^{260}$  0.6770,  $n_D^{265}$  1.2160,  $d_4^{265}$  0.6735,  $n_D^{270}$  1.2120,  $d_4^{270}$  0.6700,  $n_D^{275}$  1.2080,  $d_4^{275}$  0.6665,  $n_D^{280}$  1.2040,  $d_4^{280}$  0.6630,  $n_D^{285}$  1.2000,  $d_4^{285}$  0.6595,  $n_D^{290}$  1.1960,  $d_4^{290}$  0.6560,  $n_D^{295}$  1.1920,  $d_4^{295}$  0.6525,  $n_D^{300}$  1.1880,  $d_4^{300}$  0.6490,  $n_D^{305}$  1.1840,  $d_4^{305}$  0.6455,  $n_D^{310}$  1.1800,  $d_4^{310}$  0.6420,  $n_D^{315}$  1.1760,  $d_4^{315}$  0.6385,  $n_D^{320}$  1.1720,  $d_4^{320}$  0.6350,  $n_D^{325}$  1.1680,  $d_4^{325}$  0.6315,  $n_D^{330}$  1.1640,  $d_4^{330}$  0.6280,  $n_D^{335}$  1.1600,  $d_4^{335}$  0.6245,  $n_D^{340}$  1.1560,  $d_4^{340}$  0.6210,  $n_D^{345}$  1.1520,  $d_4^{345}$  0.6175,  $n_D^{350}$  1.1480,  $d_4^{350}$  0.6140,  $n_D^{355}$  1.1440,  $d_4^{355}$  0.6105,  $n_D^{360}$  1.1400,  $d_4^{360}$  0.6070,  $n_D^{365}$  1.1360,  $d_4^{365}$  0.6035,  $n_D^{370}$  1.1320,  $d_4^{370}$  0.6000,  $n_D^{375}$  1.1280,  $d_4^{375}$  0.5965,  $n_D^{380}$  1.1240,  $d_4^{380}$  0.5930,  $n_D^{385}$  1.1200,  $d_4^{385}$  0.5895,  $n_D^{390}$  1.1160,  $d_4^{390}$  0.5860,  $n_D^{395}$  1.1120,  $d_4^{395}$  0.5825,  $n_D^{400}$  1.1080,  $d_4^{400}$  0.5790,  $n_D^{405}$  1.1040,  $d_4^{405}$  0.5755,  $n_D^{410}$  1.1000,  $d_4^{410}$  0.5720,  $n_D^{415}$  1.0960,  $d_4^{415}$  0.5685,  $n_D^{420}$  1.0920,  $d_4^{420}$  0.5650,  $n_D^{425}$  1.0880,  $d_4^{425}$  0.5615,  $n_D^{430}$  1.0840,  $d_4^{430}$  0.5580,  $n_D^{435}$  1.0800,  $d_4^{435}$  0.5545,  $n_D^{440}$  1.0760,  $d_4^{440}$  0.5510,  $n_D^{445}$  1.0720,  $d_4^{445}$  0.5475,  $n_D^{450}$  1.0680,  $d_4^{450}$  0.5440,  $n_D^{455}$  1.0640,  $d_4^{455}$  0.5405,  $n_D^{460}$  1.0600,  $d_4^{460}$  0.5370,  $n_D^{465}$  1.0560,  $d_4^{465}$  0.5335,  $n_D^{470}$  1.0520,  $d_4^{470}$  0.5300,  $n_D^{475}$  1.0480,  $d_4^{475}$  0.5265,  $n_D^{480}$  1.0440,  $d_4^{480}$  0.5230,  $n_D^{485}$  1.0400,  $d_4^{485}$  0.5195,  $n_D^{490}$  1.0360,  $d_4^{490}$  0.5160,  $n_D^{495}$  1.0320,  $d_4^{495}$  0.5125,  $n_D^{500}$  1.0280,  $d_4^{500}$  0.5090,  $n_D^{505}$  1.0240,  $d_4^{505}$  0.5055,  $n_D^{510}$  1.0200,  $d_4^{510}$  0.5020,  $n_D^{515}$  1.0160,  $d_4^{515}$  0.4985,  $n_D^{520}$  1.0120,  $d_4^{520}$  0.4950,  $n_D^{525}$  1.0080,  $d_4^{525}$  0.4915,  $n_D^{530}$  1.0040,  $d_4^{530}$  0.4880,  $n_D^{535}$  1.0000,  $d_4^{535}$  0.4845,  $n_D^{540}$  0.9960,  $d_4^{540}$  0.4810,  $n_D^{545}$  0.9920,  $d_4^{545}$  0.4775,  $n_D^{550}$  0.9880,  $d_4^{550}$  0.4740,  $n_D^{555}$  0.9840,  $d_4^{555}$  0.4705,  $n_D^{560}$  0.9800,  $d_4^{560}$  0.4670,  $n_D^{565}$  0.9760,  $d_4^{565}$  0.4635,  $n_D^{570}$  0.9720,  $d_4^{570}$  0.4600,  $n_D^{575}$  0.9680,  $d_4^{575}$  0.4565,  $n_D^{580}$  0.9640,  $d_4^{580}$  0.4530,  $n_D^{585}$  0.9600,  $d_4^{585}$  0.4495,  $n_D^{590}$  0.9560,  $d_4^{590}$  0.4460,  $n_D^{595}$  0.9520,  $d_4^{595}$  0.4425,  $n_D^{600}$  0.9480,  $d_4^{600}$  0.4390,  $n_D^{605}$  0.9440,  $d_4^{605}$  0.4355,  $n_D^{610}$  0.9400,  $d_4^{610}$  0.4320,  $n_D^{615}$  0.9360,  $d_4^{615}$  0.4285,  $n_D^{620}$  0.9320,  $d_4^{620}$  0.4250,  $n_D^{625}$  0.9280,  $d_4^{625}$  0.4215,  $n_D^{630}$  0.9240,  $d_4^{630}$  0.4180,  $n_D^{635}$  0.9200,  $d_4^{635}$  0.4145,  $n_D^{640}$  0.9160,  $d_4^{640}$  0.4110,  $n_D^{645}$  0.9120,  $d_4^{645}$  0.4075,  $n_D^{650}$  0.9080,  $d_4^{650}$  0.4040,  $n_D^{655}$  0.9040,  $d_4^{655}$  0.4005,  $n_D^{660}$  0.9000,  $d_4^{660}$  0.3970,  $n_D^{665}$  0.8960,  $d_4^{665}$  0.3935,  $n_D^{670}$  0.8920,  $d_4^{670}$  0.3900,  $n_D^{675}$  0.8880,  $d_4^{675}$  0.3865,  $n_D^{680}$  0.8840,  $d_4^{680}$  0.3830,  $n_D^{685}$  0.8800,  $d_4^{685}$  0.3795,  $n_D^{690}$  0.8760,  $d_4^{690}$  0.3760,  $n_D^{695}$  0.8720,  $d_4^{695}$  0.3725,  $n_D^{700}$  0.8680,  $d_4^{700}$  0.3690,  $n_D^{705}$  0.8640,  $d_4^{705}$  0.3655,  $n_D^{710}$  0.8600,  $d_4^{710}$  0.3620,  $n_D^{715}$  0.8560,  $d_4^{715}$  0.3585,  $n_D^{720}$  0.8520,  $d_4^{720}$  0.3550,  $n_D^{725}$  0.8480,  $d_4^{725}$  0.3515,  $n_D^{730}$  0.8440,  $d_4^{730}$  0.3480,  $n_D^{735}$  0.8400,  $d_4^{735}$  0.3445,  $n_D^{740}$  0.8360,  $d_4^{740}$  0.3410,  $n_D^{745}$  0.8320,  $d_4^{745}$  0.3375,  $n_D^{750}$  0.8280,  $d_4^{750}$  0.3340,  $n_D^{755}$  0.8240,  $d_4^{755}$  0.3305,  $n_D^{760}$  0.8200,  $d_4^{760}$  0.3270,  $n_D^{765}$  0.8160,  $d_4^{765}$  0.3235,  $n_D^{770}$  0.8120,  $d_4^{770}$  0.3200,  $n_D^{775}$  0.8080,  $d_4^{775}$  0.3165,  $n_D^{780}$  0.8040,  $d_4^{780}$  0.3130,  $n_D^{785}$  0.8000,  $d_4^{785}$  0.3095,  $n_D^{790}$  0.7960,  $d_4^{790}$  0.3060,  $n_D^{795}$  0.7920,  $d_4^{795}$  0.3025,  $n_D^{800}$  0.7880,  $d_4^{800}$  0.2990,  $n_D^{805}$  0.7840,  $d_4^{805}$  0.2955,  $n_D^{810}$  0.7800,  $d_4^{810}$  0.2920,  $n_D^{815}$  0.7760,  $d_4^{815}$  0.2885,  $n_D^{820}$  0.7720,  $d_4^{820}$  0.2850,  $n_D^{825}$  0.7680,  $d_4^{825}$  0.2815,  $n_D^{830}$  0.7640,  $d_4^{830}$  0.2780,  $n_D^{835}$  0.7600,  $d_4^{835}$  0.2745,  $n_D^{840}$  0.7560,  $d_4^{840}$  0.2710,  $n_D^{845}$  0.7520,  $d_4^{845}$  0.2675,  $n_D^{850}$  0.7480,  $d_4^{850}$  0.2640,  $n_D^{855}$  0.7440,  $d_4^{855}$  0.2605,  $n_D^{860}$  0.7400,  $d_4^{860}$  0.2570,  $n_D^{865}$  0.7360,  $d_4^{865}$  0.2535,  $n_D^{870}$  0.7320,  $d_4^{870}$  0.2500,  $n_D^{875}$  0.7280,  $d_4^{875}$  0.2465,  $n_D^{880}$  0.7240,  $d_4^{880}$  0.2430,  $n_D^{885}$  0.7200,  $d_4^{885}$  0.2395,  $n_D^{890}$  0.7160,  $d_4^{890}$  0.2360,  $n_D^{895}$  0.7120,  $d_4^{895}$  0.2325,  $n_D^{900}$  0.7080,  $d_4^{900}$  0.2290,  $n_D^{905}$  0.7040,  $d_4^{905}$  0.2255,  $n_D^{910}$  0.7000,  $d_4^{910}$  0.2220,  $n_D^{915}$  0.6960,  $d_4^{915}$  0.2185,  $n_D^{920}$  0.6920,  $d_4^{920}$  0.2150,  $n_D^{925}$  0.6880,  $d_4^{925}$  0.2115,  $n_D^{930}$  0.6840,  $d_4^{930}$  0.2080,  $n_D^{935}$  0.6800,  $d_4^{935}$  0.2045,  $n_D^{940}$  0.6760,  $d_4^{940}$  0.2010,  $n_D^{945}$  0.6720,  $d_4^{945}$  0.1975,  $n_D^{950}$  0.6680,  $d_4^{950}$  0.1940,  $n_D^{955}$  0.6640,  $d_4^{955}$  0.1905,  $n_D^{960}$  0.6600,  $d_4^{960}$  0.1870,  $n_D^{965}$  0.6560,  $d_4^{965}$  0.1835,  $n_D^{970}$  0.6520,  $d_4^{970}$  0.1800,  $n_D^{975}$  0.6480,  $d_4^{975}$  0.1765,  $n_D^{980}$  0.6440,  $d_4^{980}$  0.1730,  $n_D^{985}$  0.6400,  $d_4^{985}$  0.1695,  $n_D^{990}$  0.6360,  $d_4^{990}$  0.1660,  $n_D^{995}$  0.6320,  $d_4^{995}$  0.1625,  $n_D^{1000}$  0.6280,  $d_4^{1000}$  0.1590,  $n_D^{1005}$  0.6240,  $d_4^{1005}$  0.1555,  $n_D^{1010}$  0.6200,  $d_4^{1010}$  0.1520,  $n_D^{1015}$  0.6160,  $d_4^{1015}$  0.1485,  $n_D^{1020}$  0.6120,  $d_4^{1020}$  0.1450,  $n_D^{1025}$  0.6080,  $d_4^{1025}$  0.1415,  $n_D^{1030}$  0.6040,  $d_4^{1030}$  0.1380,  $n_D^{1035}$  0.6000,  $d_4^{1035}$  0.1345,  $n_D^{1040}$  0.5960,  $d_4^{1040}$  0.1310,  $n_D^{1045}$  0.5920,  $d_4^{1045}$  0.1275,  $n_D^{1050}$  0.5880,  $d_4^{1050}$  0.1240,  $n_D^{1055}$  0.5840,  $d_4^{1055}$  0.1205,  $n_D^{1060}$  0.5800,  $d_4^{1060}$  0.1170,  $n_D^{1065}$  0.5760,  $d_4^{1065}$  0.1135,  $n_D^{1070}$  0.5720,  $d_4^{1070}$  0.1100,  $n_D^{1075}$  0.5680,  $d_4^{1075}$  0.1065,  $n_D^{1080}$  0.5640,  $d_4^{1080}$  0.1030,  $n_D^{1085}$  0.5600,  $d_4^{1085}$  0.0995,  $n_D^{1090}$  0.5560,  $d_4^{1090}$  0.0960,  $n_D^{1095}$  0.5520,  $d_4^{1095}$  0.0925,  $n_D^{1100}$  0.5480,  $d_4^{1100}$  0.0890,  $n_D^{1105}$  0.5440,  $d_4^{1105}$  0.0855,  $n_D^{1110}$  0.5400,  $d_4^{1110}$  0.0820,  $n_D^{1115}$  0.5360,  $d_4^{1115}$  0.0785,  $n_D^{1120}$  0.5320,  $d_4^{1120}$  0.0750,  $n_D^{1125}$  0.5280,  $d_4^{1125}$  0.0715,  $n_D^{1130}$  0.5240,  $d_4^{1130}$  0.0680,  $n_D^{1135}$  0.5200,  $d_4^{1135}$  0.0645,  $n_D^{1140}$  0.5160,  $d_4^{1140}$  0.0610,  $n_D^{1145}$  0.5120,  $d_4^{1145}$  0.0575,  $n_D^{1150}$  0.5080,  $d_4^{1150}$  0.0540,  $n_D^{1155}$  0.5040,  $d_4^{1155}$  0.0505,  $n_D^{1160}$  0.5000,  $d_4^{1160}$  0.0470,  $n_D^{1165}$  0.4960,  $d_4^{1165}$  0.0435,  $n_D^{1170}$  0.4920,  $d_4^{1170}$  0.0400,  $n_D^{1175}$  0.4880,  $d_4^{1175}$  0.0365,  $n_D^{1180}$  0.4840,  $d_4^{1180}$  0.0330,  $n_D^{1185}$  0.4800,  $d_4^{1185}$  0.0295,  $n_D^{1190}$  0.4760,  $d_4^{1190}$  0.0260,  $n_D^{1195}$  0.4720,  $d_4^{1195}$  0.0225,  $n_D^{1200}$  0.4680,  $d_4^{1200}$  0.0190,  $n_D^{1205}$  0.4640,  $d_4^{1205}$  0.0155,  $n_D^{1210}$  0.4600,  $d_4^{1210}$  0.0120,  $n_D^{1215}$  0.4560,  $d_4^{1215}$  0.0085,  $n_D^{1220}$  0.4520,  $d_4^{1220}$  0.0050,  $n_D^{1225}$  0.4480,  $d_4^{1225}$  0.0015,  $n_D^{1230}$  0.4440,  $d_4^{1230}$  0.0000,  $n_D^{1235}$  0.4400,  $d_4^{1235}$  0.0000,  $n_D^{1240}$  0.4360,  $d_4^{1240}$  0.0000,  $n_D^{1245}$  0.4320,  $d_4^{1245}$  0.0000,  $n_D^{1250}$  0.4280,  $d_4^{1250}$  0.0000,  $n_D^{1255}$  0.4240,  $d_4^{1255}$  0.0000,  $n_D^{1260}$  0.4200,  $d_4^{1260}$  0.0000,  $n_D^{1265}$  0.4160,  $d_4^{1265}$  0.0000,  $n_D^{1270}$  0.4120,  $d_4^{1270}$  0.0000,  $n_D^{1275}$  0.4080,  $d_4^{1275}$  0.0000,  $n_D^{1280}$  0.4040,  $d_4^{1280}$  0.0000,  $n_D^{1285}$  0.4000,  $d_4^{1285}$  0.0000,  $n_D^{1290}$  0.3960,  $d_4^{1290}$  0.0000,  $n_D^{1295}$  0.3920,  $d_4^{1295}$  0.0000,  $n_D^{1300}$  0.3880,  $d_4^{1300}$  0.0000,  $n_D^{1305}$  0.3840,  $d_4^{1305}$  0.0000,  $n_D^{1310}$  0.3800,  $d_4^{1310}$  0.0000,  $n_D^{1315}$  0.3760,  $d_4^{1315}$  0.0000,  $n_D^{1320}$  0.3720,  $d_4^{1320}$  0.0000,  $n_D^{1325}$  0.3680,  $d_4^{1325}$  0.0000,  $n_D^{1330}$  0.3640,  $d_4^{1330}$  0.0000,  $n_D^{1335}$  0.3600,  $d_4^{1335}$  0.0000,  $n_D^{1340}$  0.3560,  $d_4^{1340}$  0.0000,  $n_D^{1345}$  0.3520,  $d_4^{1345}$  0.0000,  $n_D^{1350}$  0.3480,  $d_4^{1350}$  0.0000,  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$d_4^{1460}$  0.0000,  $n_D^{1465}$  0.2560,  $d_4^{1465}$  0.0000,  $n_D^{1470}$  0.2520,  $d_4^{1470}$  0.0000,  $n_D^{1475}$  0.2480,  $d_4^{1475}$  0.0000,  $n_D^{1480}$  0.2440,  $d_4^{1480}$  0.0000,  $n_D^{1485}$  0.2400,  $d_4^{1485}$  0.0000,  $n_D^{1490}$  0.2360,  $d_4^{1490}$  0.0000,  $n_D^{1495}$  0.2320,  $d_4^{1495}$  0.0000,  $n_D^{1500}$  0.2280,  $d_4^{1500}$  0.0000,  $n_D^{1505}$  0.2240,  $d_4^{1505}$  0.0000,  $n_D^{1510}$  0.2200,  $d_4^{1510}$  0.0000,  $n_D^{1515}$  0.2160,  $d_4^{1515}$  0.0000,  $n_D^{1520}$  0.2120,  $d_4^{1520}$  0.0000,  $n_D^{1525}$  0.2080,  $d_4^{1525}$  0.0000,  $n_D^{1530}$  0.2040,  $d_4^{1530}$  0.0000,  $n_D^{1535}$  0.2000,  $d_4^{1535}$  0.0000,  $n_D^{1540}$  0.1960,  $d_4^{1540}$  0.0000,  $n_D^{1545}$  0.1920,  $d_4^{1545}$  0.0000,  $n_D^{1550}$  0.





✓Catalytic transformations of heterocyclic compounds.  
 XLII Catalytic transformations of trimethylene oxide and  
 trimethylene glycol Yu. K. Yur'ev and S. Levi (Mos-

cow State Univ.) *Zhur. Obshch. Khim.* 23, 2047-62 (1957); *Chem. Abstr.* 43, 29946; 49, 231d. Trimethylene oxide (I) passed over  $Al_2O_3$  at 290° gives the same products as are formed by trimethylene glycol (II):  $EtCHO$ , acrolein,  $PrCHO$ , and  $CH_3CHCH_2OH$ . Considerable decompn. of the oxirane is observed. I and II passed over  $Al_2O_3$  in a  $H_2S$  stream at 290° or 370° give the same products:  $EtCHO$ , acrolein,  $PrCHO$ ,  $CH_3CHCH_2OH$ ,  $PrOH$ , and  $CH_3CHCH_2OH$ . However, II also yields  $CH_3CHCH_2SH$  and  $(CH_3CHCH_2)_2S$ . The decompn. of I under these conditions is severe. Neither I nor II passed over  $Al_2O_3$  in  $H_2S$  yield trimethylene sulfide or other heterocyclic derivs. XLIII Transformation of  $\alpha$ -acetofuran, furfural, and furfurylidene-aniline into N-piperidopyrrole. Yu. K. Yur'ev and R. G. Vendel'man. *Izv. Akad. Nauk SSSR* 1957, 1534. Passage of 15 g.  $\alpha$ -acetofuran mixed with 12 g. 15%  $NH_3$  at 400° over  $Al_2O_3$  in N gave 26% N-piperidopyrrole (bp. 57°/torr); at 420°, the yield was 18%; at 440°, it was 16.7%; and at 475° it was 10%. The gas mixture contained  $CO_2$ ,  $O_2$ ,  $CO$ , unsat'd hydrocarbons, and piperidines, while the liquid fraction contained N-piperidopyrrole and also form under such conditions. Passage of 100 g. furfural and 20 g. 15%  $NH_3$  over the reaction zone only over  $Al_2O_3$  at 400° gave 42% furfurylideneaniline and 14% N-piperidopyrrole. Thus the azomethine and the carbonyl groups of furfural and furanidine are cleaved and converted into  $CO_2$  and  $CO$ . G. M. Kozlovskii.

YUR'YEV, Yu.K., VENDEL'SHTEYN, Ye.G.

Conversion of  $\alpha$ -acetofuran, furfurole, and furfurylidene aniline into *N*-phenylpyrrole. Zhur.ob.khim.23 no.12:2053-2056 D '53. (MLRA 7:2)

1. Moskovskiy Gosudarstvennyy universitet, Laboratoriya organicheskoy khimii im. N.D.Zelinskogo. (Heterocyclic compounds)



YUR'YEV, Yu. K.

ZEMINSKIY, N.D., akademik; KOCHESHKOV, K.A., redaktor; KAVERENNEVA, Ye.D.,  
doktor khimicheskikh nauk, redaktor; LEVINA, R.Ya., redaktor;  
YUR'YEV, Yu.K., redaktor.

[Collected works] Sobranie trudov. Moskva, Izd-vo Akademii nauk  
SSSR. Vol. 1. 1954. 514 p. (MLRA 7:8)

1. Chlen-korrespondent AN SSSR (for Kocheshkov)  
(Chemistry--Collected works)

USSR Chemistry

FD-773

Card 1/2 : Pub 129 10/24

Author : Akishin, P. A.; Rambidi, N. G.; Novitskiy, K. Yu.; Yur'yev, Yu. K.

Title : Raman spectra of heterocyclic compounds. I

Periodical : Vest. Mosk. un., Ser. fizikomat. i yest. nauk, Vol 9, No 2, 77-80, Mar 1954

Abstract : Measured the Raman spectra of cyclic sulfur compounds to obtain experimental proof for the constancy of the line intensity of the C-S bond vibration. In the spectra of sulfur-saturated compounds (thiophane, 1,4-thioxane and alpha-methyltrimethylene sulfide) the sum of the line intensities of the C-S bond was found to be constant within the limits of experimental error. In the spectra of the unsaturated sulfur compound (delta - dihydrothiopyrane) two facts are apparent: a) the sum of the line intensities for the C-S bond is much less than that of the saturated compounds; b) the intensity of the



FD-773

Card 2/2

C=C bond in the compound is greater than that of the isolated C=C bond.  
One table. Fifteen references (one foreign).

Institution : Chair of Physical Chemistry and Chair of Organic Chemistry

Submitted : July 10, 1953

[illegible]

USSR/Chemistry: Dyestuffs

FD-1606

Card 1/1 : Pub. 129-9/23

Author : Yur'yev, Yu. K. and Avbatskiy, A. V.

Title : Dyestuffs containing the pyrrolidine ring

Periodical : Vest. Mosk. un., Ser. fizikomat. i yest. nauk, 9, No 8, 63-69, Dec 1954

Abstract : Prepared azo dyes containing the pyrrolidine ring by treating N-phenylpyrrolidine with diazonium salts. Also prepared tri-phenylmethane dyes containing the pyrrolidine ring by treating N-phenylpyrrolidine with benzaldehyde and with Michler's ketones. An indamine dye containing the pyrrolidine ring was obtained through the oxidative condensation of N-phenylpyrrolidine with N-(para-aminophenyl)-pyrrolidine. The absorption spectra of pyrrolidine orange and N, N'(bis)-tetramethyleneindamine salts are further in the long wave region than those of methyl orange and the corresponding Bindshedler's salts. Five references. (all USSR). Equations; graphs.

Institution : Chair of Organic Chemistry

Submitted : June 19, 1954

YURYEV, YU. K.

Title

: Synthesis and reactions of 3,4-diketones of the tetrahydrofuran series

alphenylpiperazine, 1,1-dimethyl-2,2,4,4-tetrahydro-1H-3,4-benzodiazepine, dehydrochloride, 0.1M, 0.1M

"APPROVED FOR RELEASE: 09/19/2001

CIA-RDP86-00513R001963220013-4

APPROVED FOR RELEASE: 09/19/2001

CIA-RDP86-00513R001963220013-4"

"APPROVED FOR RELEASE: 09/19/2001

CIA-RDP86-00513R001963220013-4

APPROVED FOR RELEASE: 09/19/2001

CIA-RDP86-00513R001963220013-4"

CONFIDENTIAL



Title : Beta-furandione in the synthesis of beta-alkyl- and beta-arylfurans

Card : 1/1

Card : 1/1

Authors : Yeryev, Ya. K., and Gorin, L. F.

Title : Dehydration of N-(beta-oxethyl)-arylamines in the presence of aluminum silicate

Periodical : Zhur. ob. khim. 24/8, 1444 - 1449, August 1954

Abstract : The products obtained from dehydration of N-(beta-oxethyl)-arylamines in the presence of aluminum silicates, are described. The results of the study of the effect of the nature of the substituent in the arylamine on the orientation of the methyl or methoxyl in the arylamine and their effects on the dehydration process are given.

Institution : State University, Moscow

Submitted : March 4, 1954

USSR/ Chemistry      Synthesis methods

*Journal of Management Studies*, 19(1), 67-80.

Authors : Yagci, T., et al. / *Journal of Polymer Science: Part A: Polymer Chemistry*, 2004, 42, 10, 3511-3521

Title : Synthesis of beta-n-aryl- and beta-phenylthiophene through catalytic arylation of thiophene with aryl iodides

Periodical : Amer. Ch. Hist. Rev., 1947 - 1948, August - Oct.

**Abstract** : The effect of further alkyl complication in the basic beta-alkylfuranidines, and the effect of the bulky radical in beta-phenylfuranidine, on the rate of reaction with nitric oxide are discussed.

was attributed to presence of the phenyl group on the beta-carbon atom of the furaniline cycle. Eleven references: 8 USCR; 2 German and 1 French (1902 - 1954).

in addition to the following, for

Submitted : March 22, 1954

USSR/Chemistry

Card 1/1 : Pub. 151 - 17/42

Authors : Iuryev, Yu. K.; Elyakov, G. B.; and Belyakova, Z. V.

Title : Acyloxylans in the synthesis of aromatic keto acids

Periodical : Zhur. ob. khim. 24/9, 1568-1571, 3rd 1954

Abstract : A new method for the synthesis of aromatic keto acids, which utilizes only dibasic acids for its reactions and not anhydrides or chloro-anhydrides, is introduced. The various aromatic acids derived with the aid of this method, are described. The possibility of such acylation of the benzene nucleus with esters of dibasic acids was established by the derivation of benzoyl acetic ethyl ether. Twenty-four references: 3-USSR; 15-German; 3-USA and 3-French (1880-1952).

Institution : State University, Moscow

Submitted : March 8, 1954



1. Title: Conversion of 3,4-dimethylfuranidine into 3,4-dimethylthiothana and 3,4-dimethylthiothana-2-thione

2. Author: [illegible]

3. Abstract: The paper describes the conversion of 3,4-dimethylfuranidine into 3,4-dimethylthiothana and 3,4-dimethylthiothana-2-thione. The reaction is carried out in the presence of a catalyst. The catalyst is a mixture of [illegible] and [illegible]. The reaction is carried out in the presence of a catalyst. The catalyst is a mixture of [illegible] and [illegible]. The reaction is carried out in the presence of a catalyst. The catalyst is a mixture of [illegible] and [illegible].

4. Institution: State University, Moscow

Y. R. Y. F. Y. K.

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Preparation of some...  
P. G. and A. N. V. ...  
Y. R. 24, 1913 164 (22) ...  
1523K

CH (2)

MA  
[Signature]

UCSR/Chemistry - Synthetic materials

Card 1/3      Pub. 151 - 00/37

Author:      [illegible]

Title:      [illegible]

Periodical: Zhur. ob. khim. 24/10, 1851-1853. Oct 1954

Abstract:      [illegible]

Indexing:      [illegible]

Submitted:      [illegible]





NOVOSELOVA, A.V., otv.red.; VOL'FKOVICH, S.I., red.; GERASIMOV, Ya.I.,  
red.; YUR'YEV, Yu.K., red.; YUR'YEVA, L.P., red.

[Department of Chemistry of Moscow State University] Khimi-  
cheskii fakul'tet Moskovskogo ordena Lenina i ordena Trudovogo  
Krasnogo Znameni gosudarstvennogo universiteta imeni M.V.Lomonoso-  
va. Moskva, 1955. 59 p. (MIRA 13:6)

1. Moscow. Universitet.  
(Moscow University) (Moscow--Chemistry--Study and teaching)

YUR'YEV, Yu.K.

ZELINSKIY, Nikolay Dmitriyevich, 1861-1953 [deceased] KAZANSKIY, B.A., akademik; BALANDIN, A.A., akademik; KOCHESHKOV, K.A.; SHUYKIN, M.I.; KAVERZNEVA, Ye.D, doktor khimicheskikh nauk; LEVINA, R.Ya., doktor khimicheskikh nauk; PLATE, A.F., doktor khimicheskikh nauk; RUBINSKIY, A.M., doktor khimicheskikh nauk; YUR'YEV, Yu.K., doktor khimicheskikh nauk; KISELEVA, A.A., tekhnicheskii redaktor.

[Collected works] Sbornie trudov, Moskva, Izd-vo Akademii nauk SSSR.  
Vol. 2. 1955. 743 p. (MLRA 8:11)

1. Chlen-korrespondent AN SSSR (for Kocheshkov and Shuykin)  
(Hydrocarbons) (Petroleum)

YUR'YEV, Y. K

[illegible]



KAZANSKIY, B.A.; LEVINA, B.Ya.; YUR'YEV, Yu.K.

The chemistry of hydrocarbons and heterocyclic compounds in the  
works of N.D. Zelinskii and his school. Vest. Mosk. un, 10  
no. 45:145-167 Ap-My '55. (MLBA 8:8)  
(Hydrocarbons) (Zelinskii, Nikolai Dmitrievich, 1861-1953)

KOROBITSYNA, I.K.; YUR'YEV, Yu.K.; LUKINA, Ye.M.

$\beta$ -aminofuranidine and diglycolic acid from  $\beta$ -furanidone.  
Zhur.ob.khim. 25 no.3:563-565 Mr '55. (MIRA 8:7)

1. Moskovskiy Gosudarstvennyy universitet.  
(Furan) (Diglycolic acid)







1. The first part of the document is a header section containing the following information:
 

- Page No. 1
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- Page No. 1
- Date: 10/10/2010
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2. The second part of the document is a table with the following columns:
 

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93	ABHIRAM K	10	100

[illegible]

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1. The first part of the document is a list of the names of the persons who were present at the meeting. The names are listed in alphabetical order. The names are: [illegible]

2. The second part of the document is a list of the topics that were discussed at the meeting. The topics are listed in alphabetical order. The topics are: [illegible]

3. The third part of the document is a list of the actions that were taken at the meeting. The actions are listed in alphabetical order. The actions are: [illegible]

4. The fourth part of the document is a list of the conclusions that were reached at the meeting. The conclusions are listed in alphabetical order. The conclusions are: [illegible]

Catalytic transformation of ethylene sulfide and ethane  
 sulfide. L. E. Yurey and G. S. Kostin, *Sov. Chem. (Engl. Transl.)* 1967, 10, 1000. (Khim. 1967, 10, 1000). - Pass-  
 age of 10 g. ethylene sulfide in N over Al<sub>2</sub>O<sub>3</sub> at 220° gave  
 41% 1,4-dithiane, in 110-115°, and a mixture of gases contg.  
 much H<sub>2</sub>S and C<sub>2</sub>H<sub>4</sub>; the reaction run in H<sub>2</sub>S atm. at 220°  
 gave 84% dithiane; higher temps. gave lower yields. Pass-  
 age of 10 g. ethane in N over Al<sub>2</sub>O<sub>3</sub> at 220° gave 51% dithiane  
 and much H<sub>2</sub>S and gaseous hydrocarbons; at 220° no re-  
 action took place, while at 280° the dithiane formed.

G. S. Kostin

*above  
 Fried*

*EM*

FOR 1-1, 1-11.

AID P - 3582

Subject : USSR/Chemistry

Card 1/1 Pub. 152 - 19/20

Authors : Yur'yev, Yu. K., A. V. Arbatskiy, I. K. Korobitsyna,  
and V. M. Andreyev

Title : Preparation of N-phenylpyrrolidine from 1,4-butanediol  
and aniline in the presence of aluminosilicate

Periodical : Zhur. prikl. khim., 28, 7, 781-782, 1955

Abstract : Under optimum reaction conditions, the yield of  
N-phenylpyrrolidine obtained was 68.1%. The prepara-  
tion is described in detail. One table, 5 references,  
all Russian (1937-1950).

Institution : None

Submitted : Je 30, 1954

USSR, Chemistry - Organic chemistry

Card 1 Part. 22 - 28/49

Authors : Surkov, Yu. K., Belyakov, A. M. and Belyakova, Z. V.

Title : Synthesis of 1,4-dioxane-2,5-dione derivatives of the thiophene series

Periodical : Dokl. Akad. Nauk SSSR, 1955, 123-125, May 2, 1955

Abstract : This paper describes the synthesis of 1,4-dioxane-2,5-dione derivatives from dicarboxylic acids and the synthesis of thiophene-2,5-dione by conducting the reaction in nitrobenzene in the presence of anhydrous aluminum chloride one can easily obtain good yields of thiophene-2,5-dione of the thiophene series. The names of the products and yields obtained by the method described above are listed. The reaction of the thiophene-2,5-dione with the presence of anhydrous aluminum chloride was also described. (Seven references; 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 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619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1510, 1511, 1512, 1513, 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4-11 7-12 3 001  
YUR'YEV, Yu.K., prof.; NESMEYANOV, A.N., akademik, otv.red.

[Laboratory work in organic chemistry; program for the Chemistry Faculty] Programma praktikuma po organicheskoi khimii (dlia khimicheskogo fakul'teta). 1956. 14 p. (MIRA 11:3)

1. Moscow, Universitet.

(Chemistry, Organic--Study and teaching)



*Yur'yev, Yu. K.*  
USSR/Physical Chemistry - Molecule, Chemical Bond.

B-4

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3575.

Author : P.A. Akishin, N.G. Rambidi, Yu. K. Yur'yev.  
Inst : Moscow University.  
Title : Raman Spectra of Heterocyclic Compounds. III.

Orig Pub: Vestn. Mosk. un-ta, 1956, 61-67.

Abstract: Raman spectra of ten sulphur containing heterocyclic compounds - trimethylenesulfide, thiophene, 2- and 3-methyltetrahydrothiophenes, 2,2-, 3,3-, 2,5-, 3,4- and 2,4-dimethyltetrahydrothiophenes and tetrahydrothiopyrine were obtained. The line intensities were measured photometrically using one and the same objective scale. The characteristic of the differential band intensity of the C-S link valence vibrations is shown. An exception is the intensity of the frequencies  $\nu$  (C-S) in the 3,3-dimethyltetrahydrothiophene spectrum, which surpasses the others by 20%. This fact is explained by a possible interaction of  $\nu$  (C-S) fre-

Card : 1/2

-43-

USSR/Physical Chemistry - Molecule, Chemical Bond.

B-4

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3575.

quencies with holosymmetrical vibrations of the group containing the quaternary C atom. The intensity decrease of (C-S) $\nu$  bands in compounds having conjugate C-S and C=C links, for example, in  $\Delta^2$ -dihydrothiopyran and thiophene, is noted. See part II in RZhKhim, 1956, 53677.

Card : 2/2

-44-

YUR'YEV, Yu.K.; GERMAN, L.S.

Synthesis of N-( $\beta$ -mercaptoethyl)-arylamines and N-( $\beta$ -mercaptoethyl)-pyrrolidine. Vest.Mosk.un. Ser.mat.,mekh.,astron.,fiz.,khim. 11 no.1:197-199 '56. (MIRA 10:12)

1. Kafedra organicheskoy khimii Moskovskogo universiteta.  
(Amines) (Pyrrolidine)

*YUR'YEV, YU.K.*

YUR'YEV, Yu.K.; YEL'YAKOV, G.B.; BELYAKOVA, Z.V.

Cyanoethylation of isopropyl-2-thienyl ketone. Vest.Mosk.un.

Ser.mat., mekh., astron., fiz., khim. 11 no.1:201-203 '56. (MIRA 10:12)

1. Kafedra organicheskoy khimii Moskovskogo universiteta.

(Thienyl ketone)

(Ethylation)

YUR'YEV, YU.A.

LEVINA, R.Ya.; YUR'YEV, Yu.K.

Academician S.S. Nametkin's studies in the field of chemistry of alicyclic hydrocarbons and their derivatives; on the occasion of the 80th anniversary of his birth. Vest. Mosk. un. Ser. mat. mekh., astron., fiz., khim. 11 no.2:121-133 '56. (MIRA 10:12)

1. Kafedra organicheskoy khimii Moskovskogo gosudarstvennogo universiteta.

(Nametkin, Sergei Semenovich, 1876-)  
(Alicyclic compounds)









Yun-yun Y. K.

Chen

1. The first part of the report is a general introduction to the subject of the study. It discusses the importance of the study and the objectives of the research. The second part of the report is a detailed description of the methodology used in the study. It includes a description of the data sources, the sample size, and the statistical methods used to analyze the data. The third part of the report is a discussion of the results of the study. It includes a description of the findings and a comparison of the results with previous research. The fourth part of the report is a conclusion and a list of references.

For the purpose of this study, G. M.  
the following information was obtained:  
The first part of the study was a  
review of the literature on the  
subject of the role of the  
government in the economy.  
The second part of the study was a  
survey of the opinions of  
experts on the subject of the  
role of the government in the  
economy. The survey was  
conducted in 1945. The  
results of the survey are  
presented in the following  
table.

1/11  
2/2

YUR'YEV, Yu.K.; GERMAN, L.S.

Synthesis of 3-aryl- and 2,3-diarylthiazolidines. Zhur.ob.khim.  
26 no.2:550-553 F '56. (MLRA 9:8)

1. Moskovskiy gosudarstvennyy universitet.  
(Thiazolidine)

YUR'YEV, Yu.K.; LUKINA, Ye.M.; POLINARPOV, Yu.M.; VOLKOV, V.P.

Catalytic conversions of heterocyclic compounds. Part 48. Preparation of 3-isoamyl-, 3-hexyl-, and 3- $\beta$ -tolyltetrahydrothiophenes from corresponding furanidines. Zhur.ob.khim. 26 no.2: 553-557 F '56. (MLBA 9:8)

1. Moskovskiy gosudarstvennyy universitet.  
(Thiophene) (Furan)



YUR'YEV, Yu.K.; YEL'YAKOV, G.B.; VYSOKOSOV, A.N.

Tetraacyloxysilanes in the synthesis of  $\alpha,\beta$ -unsaturated acids.  
Part 1. Synthesis of cinnamic acid. Zhur.ob.khim. 26 no.3:926-930  
Mr '56. (MLRA 9:8)

1. Moskovskiy gosudarstvennyy universitet.  
(Cinnamic acid)

YUR'YEV, Yu.K.; SADOVAYA, N.K.

Chemistry of selenophene. Part 2. Acylation of 3,4-dimethylselenophene by tetraacyloxysilanes. Zhur.ob.khim. 26 no.3:930-933 Kr '56.  
(MLBA 9:8)

1. Moskovskiy gosudarstvennyy universitet.  
(Selenophene) (Silane) (Acylation)

Yur'yev, Yu. K.

3  
1. ~~Reaction of the synthesis of cinnamic acid~~  
acids. I. Synthesis of cinnamic acid. ~~Gen. Chem.~~  
A. B. El'yakov, and A. N. Ushakov. ~~See C.A.~~  
C.S.S.R. 20, 1-51, 1964 (English translation).  
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DM



YUP 100 K.

Chemistry of selenophene <sup>or Acetylene, of 3.6-dl</sup>  
with tetraacylpyridines. U.S. S. R. 26.  
Pur'ev and A. R. Sadotava. J. Gen. Chem. 50, 147064.  
1057-3(1965) (English translation). See C. A. B. M. R.

PM

USSR/ Organic Chemistry - Synthetic organic chemistry

E-2

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 11649

Author : Korobitsayna I.K., Yur'yev Yu.K., Shvedova S.N.

Title : Synthesis of 1,4-Diaminobutanone-2.

Orig Pub : Zh. obshch. khimii, 1956, 26, No 6, 1660-1662

Abstract : 51 g of 1, 4-dichlorobutyne-2 are stirred for 8 hours with 2 liters of concentrated  $\text{NH}_4\text{OH}$ , acidified with concentrated  $\text{HCl}$ , evaporated 70 hours, extracted with ether; yield of 1,4-diaminobutyne-2 (I) 37%, BP 82-84°/6 mm, MP 41-43°. 5.4 g I in 360 ml 10% solution  $\text{KOH}$  are shaken for 3 hours with 18.4 g  $\text{C}_6\text{H}_5\text{COCl}$  to convert to N,N'-dibenzoyl-1, 4-diaminobutyne-2 (II), yield 90.3%, MP 210° (from alcohol); 15 g II; 900 ml 90%  $\text{CH}_3\text{COOH}$  and 6 g  $\text{H}_2\text{SO}_4$  allowed to stand for 12 hours, heated 20 hours at 70-80°, filtered, solvent evaporated, added 300 ml water; yield of N,N'-dibenzoyl-1, 4-diaminobutanone-2 (III) 72%; 3 g III boiled 30 hours with 75 ml 98%  $\text{CH}_3\text{COOH}$  + 75 ml concentrated  $\text{HCl}$  (added four times 10 ml of  $\text{HCl}$ ). Solution decolorized with charcoal, evaporated in vacuum, and extracted with ether. To almost dry residue added 35 ml alcohol; at 0° the hydrochloride of 1,4-diaminobutanone-2 separates out, yield 65%, MP 215-216° (decomposition).

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3,4-Diketones of the larralding series of bispirane type in the synthesis of condensed heterocyclic systems. I. K. - 4

Yur'ev, Y. K., and  
K. M. Lukina, Sov. Khim. Zh., 1974, 17, 1172.  
K. M. Lukina, Sov. Khim. Zh., 1974, 17, 1172. Heating  
0.8 g (2.2 mmole) of 2,2,4,4-tetrakis(methylene-  
bis(methylene-2,4-dione) (I) and 0.2 g (2.2 mmole) of 2,2,4,4-tetrakis(methylene-  
bis(methylene-2,4-dione) (II) in 10 ml of CH<sub>2</sub>Cl<sub>2</sub> and  
10 ml of 10% NaOH solution, followed by treatment with  
HCl, and then with H<sub>2</sub>O, gave 0.1 g (10%) of 2,2,4,4-tetrakis(methylene-  
bis(methylene-2,4-dione) (III). Similarly II gave 0.1 g (10%)  
of 2,2,4,4-tetrakis(methylene-2,4-dione) (IV).

2,2,4,4-tetrakis(methylene-2,4-dione) (I) (1.1 g, reduced 1.1 g)  
in 10 ml of 10% NaOH solution and 10 ml of 10% HCl solution,  
after removing the solvent, and then with H<sub>2</sub>O, gave 0.1 g (10%)  
of 2,2,4,4-tetrakis(methylene-2,4-dione) (III). Similarly II gave 0.1 g (10%)  
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of 2,2,4,4-tetrakis(methylene-2,4-dione) (III). Similarly II gave 0.1 g (10%)  
of 2,2,4,4-tetrakis(methylene-2,4-dione) (IV).

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2. p-*nitro*-1,3,5-trimethoxybenzoyl chloride (1.4 mmole) in 10 ml. EtOH (1.18 g), 0.56 g. semi-carbonyl HCl and 10 ml. AcOH refluxed 1 hr. and quenched in H<sub>2</sub>O gave 80% of 1-monoethoxycarbonyl, m. 182.5-183°, which on 5 g. refluxed in 10 ml. 40% NaOH 3 hrs. gave, on addition of water, 1.4 g. 75% of 1-ethoxy-5,3,7-trimethoxybenzoyl chloride (I) and 1-ethoxy-5,3,7-trimethoxybenzoic acid (IIa, R = OH), m. 141-142° (decolor. ether). IIa above gave 65% of 1-ethoxy-5,3,7-trimethoxybenzoic acid (I, 1,1,1-trimethoxy, m. 141-142°). II (1.1 g.) and 1,3,5-trimethoxybenzoic acid (III) in 10 ml. pyridine and 10 ml. H<sub>2</sub>O gave 85% of 1-monoethoxycarbonyl, m. 175-176°. Refluxing 1.04 g. II, 0.56 g. III, and 10 ml. AcOH 1 hr. refluxed 2 hrs. in 40% NaOH and refluxing 2 hrs. gave 75% of 1-monoethoxy-5,3,7-trimethoxybenzoic acid (I, 1,1,1-trimethoxy, m. 184-185°. Similarly I gave on refluxing with III in 40% NaOH a low yield of IIa (R = OH). IV (m. 141-142°) was a crude acid 1-monoethoxycarbonyl, m. 141-142°. On refluxing 2 hrs. in 40% NaOH gave 1-ethoxy-5,3,7-trimethoxybenzoic acid (IV). G. M. K.

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